

WHAT IS CLAIMED IS:

1. A process for producing a semiconductor device which comprises forming a thermal oxide film on a silicon substrate, and carrying out a heat-treatment at a temperature of not lower than 800°C while keeping the oxide film and surface of silicon substrate in a bare state in an inert atmosphere, followed by introduction of impurities, formation of electrodes and wiring, and formation of an insulating film so as to form a transistor.
2. A process for producing a semiconductor device which comprises, after completing the selective oxidation for forming an oxide film having a partially increased thickness on the surface of a silicon substrate for electrically insulating and isolating the semiconductor elements, removing the thin films other than the oxide film, carrying out a heat-treatment at a temperature of not lower than 950°C while keeping the oxide film or silicon substrate in a bare state in an inert atmosphere, followed by formation of gate oxide film, introduction of impurities, formation of electrodes and wiring, formation of an insulating film so as to form a transistor.
3. A process for producing a semiconductor device which comprises forming an oxide film having a partially increased thickness on the surface of a silicon substrate for electrically insulating and isolating the semiconductor elements, thereafter forming a gate oxide

0997207 101601

film of MOS type transistor and, just after completing the gate oxidation or after forming the gate electrodes, carrying out a heat-treatment at a temperature of not lower than 800°C in an inert atmosphere, followed by introduction of impurities, formation of electrodes and wiring, formation of an insulating film so as to form a transistor.

4. A semiconductor device obtained by forming a thermal oxide film, subsequently carrying out a heat treatment at a temperature of not lower than 800°C while keeping the surface of the oxide film or silicon substrate in a bare state, followed by introduction of impurities, formation of electrodes and wiring, formation of an insulating film so as to form a transistor.

5. A semiconductor device obtained by completing a selective oxidation for forming on the surface of a silicon substrate an oxide film having a partially increased thickness for electrically insulating and isolating semiconductor elements, thereafter removing the thin films other than the oxide film, carrying out a heat-treatment at a temperature of not lower than 950°C while keeping the oxide film or silicon substrate in a bare state, followed by formation of a gate oxide film, introduction of impurities, formation of electrodes and wiring, and formation of an insulating film so as to form a transistor.

6. A semiconductor device obtained by forming on

0997207 101501

the surface of a silicon substrate an oxide film having a partially increased thickness for electrically insulating and isolating semiconductor elements, thereafter forming a gate oxide film of MOS type transistor and, just after completion of the gate oxidation or after formation of gate electrodes, carrying out a heat-treatment at a temperature of not lower than 800°C, followed by introduction of impurities, formation of electrodes and wiring, formation of an insulating film so as to form a transistor.

7. A semiconductor device according to Claim 4, wherein said semiconductor device is a memory device selected from flash memory, DRAM, and SRAM or a computing device.

8. A process for producing a semiconductor device according to Claim 1, wherein said thermal oxidation is carried out at least in an atmosphere of a gaseous mixture of hydrogen and oxygen or in an atmosphere of H₂O.

9. A semiconductor device according to Claim 4, wherein said thermal oxide film is obtained by carrying out oxidation at least in an atmosphere of a gaseous mixture of hydrogen and oxygen.

10. A process for producing a semiconductor device according to Claim 1, wherein the atmosphere of the heat-treatment is an inert gas selected from nitrogen, hydrogen and argon, or a gaseous mixture of these gases, said gas or gaseous mixture being able to contain 5% or

09977207 101601

less of oxygen.

11. A semiconductor device according to Claim 4, wherein the heat treated thermal oxide film is obtained by the heat-treatment in an inert gas selected from nitrogen, hydrogen and argon, or a gaseous mixture of these gases, said gas or gaseous mixture being able to contain 5% or less of oxygen.

add
Ar
999
B33
0997507-101601